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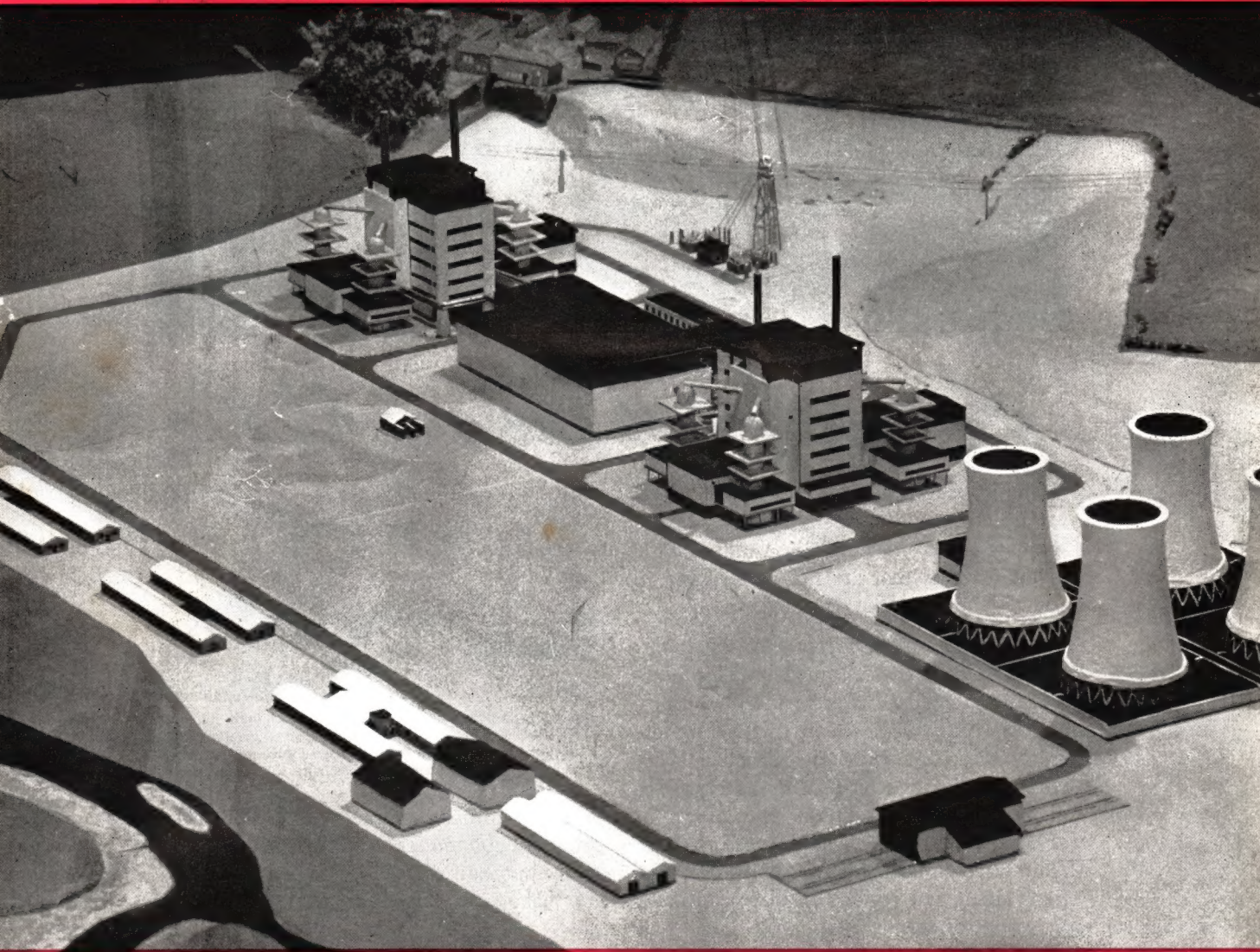
December 5, 1953

VOL. 64, NO. 23 PAGES 353-368

SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Atomic Power Station

See Page 359

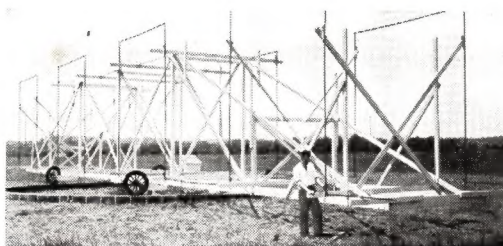
A SCIENCE SERVICE PUBLICATION



How silent is the night?

Watching the serenity of Christmas skies, we are conscious of deep silence. Yet the stars are talking to us all the while—talking in radio waves that are full of meaning to scientists probing the depths of space.

The important discovery that some stars produce radio waves was made by a Bell Laboratories scientist while exploring atmospheric disturbances which might interfere with transoceanic telephone service. His discovery marked the birth of the fast-growing science of radio astronomy. It is telling us of mysterious lightless stars that broadcast radio waves, and it promises exciting revelations about vast regions of space concealed by clouds of cosmic dust.



Directional radio antenna used by Karl G. Jansky, in the discovery of stellar radio signals at the Holmdel, New Jersey, branch of Bell Telephone Laboratories. In 1932 he detected waves of 14.6 meters coming from the direction of Sagittarius in the Milky Way.

It is another example of how Bell Telephone Laboratories scientists make broad and important discoveries as they seek ways to make your telephone serve you better.



BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

ARCHAEOLOGY

New Ancient Man

From 25 fragments of fossilized bones, a skull of Saldanha Man has been pieced together. This forerunner of modern man made and used crude hand-axes.

► **DISCOVERY OF** a new kind of ancient man reported from Cape Town, South Africa, is being discussed by anthropologists as they readjust to the Piltdown Man hoax. (See SNL, Nov. 28, p. 350.)

Although a number of remains of man's ancestors have been found in the past in Africa, it is not until now that human bones of great antiquity have been located in the Cape of Good Hope region.

It was by painstakingly piecing together 25 fragments of fossilized bone that scientists rebuilt the skull of this primitive forerunner of modern man to whom they gave the name Saldanha Man.

Saldanha Man was a beetle-browed individual with a strikingly sloping forehead, thick skull and low cranial vault.

Indications from the attachments of the muscles of the nape of the neck are that he did not walk erect, but had the crouching posture of Neanderthal man. He had less brain matter in his skull than either Rho-

desian Man or most Neanderthals. However, he was capable of making and using the crude hand-axe, examples of which were found strewn about near the skull bones.

The human bones, along with those of a variety of long-extinct animals were found scattered over an area of several thousand acres on the west coast of Africa about 80 miles due north of Cape Town.

Strong winds had whipped over the arid land, scouring out troughs and valleys, winnowing out the fossils and stone tools, and driving the sand northwards in vast moving sand dunes.

Among the extinct animal bones were those of a giant-horned buffalo and a giant warthog with teeth greatly exceeding in size those of any living forms of that animal. The African mammoth is well represented among the bones, and there is one set of teeth of a rare primitive giraffe.

The bones of Saldanha Man were collected by Keith Jolly, field officer for the

expedition from the University of Cape Town investigating the site.

Details of the find were reported in *Nature* (Oct. 31) by Prof. M. R. Drennan of the University of Cape Town. The ancient forerunner of modern man received his name from the almost landlocked bay on the borders of which the bones were found, Saldanha Bay.

The finds were declared "better preserved and more complete than any other Stone Age site in South Africa."

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ARCHAEOLOGY

Africa Got Corn From America Before 1000 A.D.

► **NEGRO AND** Arab peoples in Africa had contacts with the Americas at least 500 years before Columbus, Prof. M. D. W. Jeffreys, of the University of Witwatersrand, Johannesburg, South Africa, reports in *Nature* (Nov. 21).

He cites as evidence a find of pottery in the Yoruba territory of Nigeria decorated with a design made by rolling a corn cob over wet clay. Prof. Jeffreys dates this pottery, discovered by A. J. H. Goodwin, as having been made around the year 1000.

Most historians of corn and archaeologists are agreed that corn is native to the Western Hemisphere. Prior to this report there has been evidence to show that corn was in Europe or Africa before Columbus' discovery of America and corn.

Prof. Jeffreys also reports that an analysis of the language of tribes in West Africa shows that the word for corn or maize, in European terminology, came from the north and east, the general direction of Arab tribes. He points out that if corn had been introduced by the Portuguese on the coast this would not be true.

"My researches over the past seven years have now accumulated sufficient data to establish Arab-Negro contacts with the Americas beginning about A.D. 900," he concludes.

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BIOLOGY

Highest Flying Monkeys at Zoo

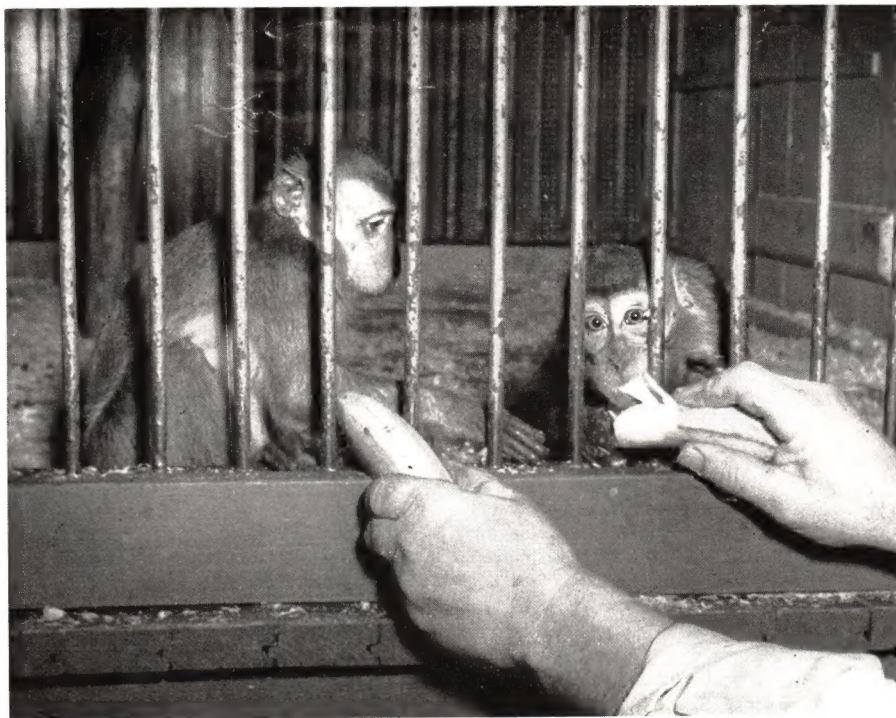
► **THE HIGHEST** flying monkeys on earth are at home in the National Zoological Park in Washington, gifts to the zoo from the U. S. Air Force.

In September, 1952, the two monkeys, Philippine macaques, were sent aloft 200,000 feet in an Aerobee rocket from White Sands, N. Mex. Under study since then at Wright-Patterson Air Force Base, Ohio, the monkeys have showed no ill effects from their extraordinary journey.

Dr. William Mann, director of the zoo, has given them a cage to themselves as stellar attractions.

They are the first monkeys to have returned safely from such heights.

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HIGH FLYING MONKEYS—The first two monkeys to return safely from an Aerobee rocket flight 200,000 feet above the ground, now residents at the National Zoological Park in Washington, are shown here. The Philippine macaques were sent aloft as part of a program to determine the effects of upper air flights on animals, and thus infer how humans might react under such conditions.

MEDICINE

Grief Is Baldness Cause

► THE POPULAR notion that shock or sudden grief can cause baldness gets medical confirmation in a report from Dr. Charles L. Schmitt of Pittsburgh to the *Pennsylvania Medical Journal* (Nov.).

He reports 50 patients, many of whom lost not only all the hair on their heads but also eyebrows, eyelashes and underarm hair. In almost half the cases, 23 of the 50, there was a definite history of physical or emotional injury.

Typical was a well known American skin specialist serving with the Navy. He was riding in a speedboat that was struck by a tug and cut in half. He did not know the accident was about to happen and was completely surprised when he found himself under water. Exactly 18 days later when he awakened in the morning, he found practically all his hair on his pillow. Only an area about one inch wide at the outer edge of the scalp still had hair.

In about six months, without any special treatment, his hair came back in. Then a few years later, while skiing, he struck a

rock and was knocked unconscious. His hair fell out again 19 days later, in the same pattern, and regrew later.

Women and men are affected about equally, Dr. Schmitt's report shows. One of the female cases was that of a 22-year-old healthy young woman who, nine months after marrying a soldier in the Air Force, received word that he had been killed in action.

Two weeks later she had a nervous breakdown and lost all her hair. Her husband, however, had been taken prisoner. Soon after she learned this, he returned home and all her hair regrew.

She lost her hair again when mother-in-law difficulties occurred. When she moved into her own home a year later, her hair regrew again.

Some of the cases Dr. Schmitt reported were his own patients, some those of other doctors. Reports of such cases in medical journals heretofore, he found, had been few in number.

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MEDICINE

Help Cerebral Palsied

► HAND-OPERATED IRON lungs show promise of helping cerebral palsied children learn to talk, Dr. Robert Harrington, speech pathologist of the Orthopaedic Hospital, Los Angeles, reported at the United Cerebral Palsy convention in New York.

The cerebral palsied child has trouble talking because he cannot sustain a tone for even one second, whereas 10 seconds of sustained tone are necessary for intelligible speech.

Various methods, including automatic iron lungs such as help polio victims, have been tried unsuccessfully in the effort to teach the cerebral palsied breath control for speech. The automatic iron lungs failed because the palsied patients fought them instead of breathing with them.

The hand-operated iron lung, or respirator, can, however, be adapted to each patient's needs. It is used by an assistant or therapist and, with its aid, the patient is helped to develop more rhythmic breath control.

Dr. Harrington said this method has been used 90 times on patients between the ages of eight and 28. Results justify continuing the work, he said, although no conclusions as to its final value can be given now.

Promising eventual help to the cerebral palsied also were reports that many parts of the neuromuscular disorder have now been duplicated in monkeys, thus giving scientists a laboratory animal for study of the disease, and the finding of a new drug that can relieve muscle spasms in animals.

It is not yet ready for trial on patients, however.

The monkey research was done by Dr. Frederick A. Mettler, College of Physicians and Surgeons, Columbia University, New York. The new drug, derived from beta erythroidine, was reported on by Prof. Stanley Tarbell of the University of Rochester, Rochester, N. Y.

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DERMATOLOGY

Freeze, Brush Off Acne Scars on Skin

► ACNE SCARS and other skin defects, such as smallpox and chicken pox scars, warts, calluses, tattoos and wrinkles, can be removed by a freezing and wire-brushing method devised by Dr. Abner Kurtin of New York.

Successful use of the method on 273 patients is reported by Dr. Kurtin in the *Archives of Dermatology and Syphilology*, published by the American Medical Association. Most of the patients have been followed for at least two years, and some for as long as four years, without recurrence of the defects.

After chilling, cleaning and freezing the skin with a chemical ice pack, alcohol and ethyl chloride, the skin is planed by a small brush made of stainless steel wire, each strand of which is slightly curved. The

brush is attached through a flexible hand piece and shaft to a mounted motor. The motor rotates 12,000 times a minute and is operated by a foot switch permitting variable speed controls.

Following abrasion, a piece of dry gauze is applied to the area. Dressings are changed daily, and complete healing usually occurs within a week.

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Airborne classes are a permanent feature of the *science curriculum* at the University of Paris; they have been found useful particularly in the fields of geography, geology, botany, archaeology and physics.

SCIENCE NEWS LETTER

VOL. 64 DECEMBER 5, 1953 NO. 23

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PHYSICS

"Brain" Plays Music

Electronic computer at National Bureau of Standards, as result of spare-time contest by two mathematicians, can now be forced to play music as a novelty on occasion.

➤ ELECTRONIC STRAINS of music—"Dixie," "America" and "K-K-K-Katy"—can be heard issuing from the National Bureau of Standards' electronic "brain" computer in Washington.

This unusual concert can occur during early morning warming-up, before the big brain starts its complicated mathematical operations. The musical sounds are produced on occasion as a novel way to give the machine its morning exercise while the tubes get set to do their work.

The musical sounds are caught by audio detectors and amplifiers when artificial delays in the computation process are introduced into the performance of the machine. Usually the machine works so fast that the electrical tone of the tubes is too high to be heard unless detected and amplified.

The speed of the machine, which is known as SEAC, has to be changed to make it musical.

A spare-time contest between two of the machine's masters resulted in the perfection of the musical performances. Frank Stockmal won first musical honors by performing "Dixie," even though he comes from New

Haven, Conn. Then he programmed "K-K-K-Katy" and, later, "America."

The composition and first performance of "America" resulted from a check by SCIENCE SERVICE on a rumor that the computer was warmed up every morning by playing the "Star Spangled Banner." Some notes of this patriotic song would be rather difficult to produce on the computer, Mr. Stockmal said.

Since the machine has a range of only about two octaves, its possible repertoire is quite limited. Other songs known to have been programmed on other computers are "God Save the King" in England and "Auld Lang Syne" in Philadelphia.

By giving the machine instructions that force it to delay a certain time, say a five-hundredth of a second, between each of its computations on a problem, a note that corresponds to 500 cycles per second, or about C above middle C on a piano keyboard, can be forced from the computer. Different notes can be played by varying the time delay introduced in working out the problem.

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INVENTION

Jet Plane Launcher

➤ A BRITISH inventor has created a ground-based launching device for hurling jet airplanes into the air.

Barnes Neville Wallis of Weybridge, Eng., states his launcher eliminates the need for heavy assisted take-off equipment on the plane. Furthermore, should the plane's engine be defective "in any way" upon take-off, the craft can land within the limits of the airport.

The new device also promises to permit airports to devote one runway exclusively to taking-off planes, keeping one strip always open to landing planes. This, Mr. Wallis believes, will double the traffic capacity of many existing airports.

The launcher is a four-wheeled frame powered on rails by four jets. The airplane is mounted on a lever apparatus which holds the plane parallel to the earth and faces it into the wind.

As the plane's wings begin biting the air, the lifting force is transmitted to the lever. When the force is sustained for a given length of time, to assure that the plane will remain airborne, the plane is unlocked from the carriage and it roars into the sky under its own power.

Mr. Wallis' invention was granted patent

No. 2,659,553 by the U. S. Patent Office. The inventor assigned his patent to Vickers-Armstrongs Ltd., of London.

Science News Letter, December 5, 1953

ELECTRONICS

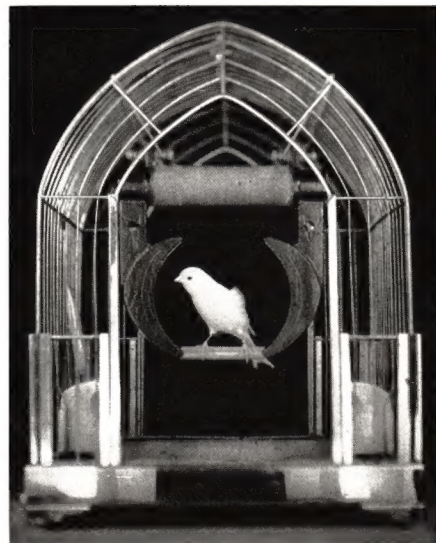
Electronic "Brain" For Missile Control

➤ TWO NEW electronic "brains," lightweight enough for air-borne control of guided missiles, were revealed by the Jacobs Instrument Company, Bethesda, Md.

The small but high speed computers, one of which has been built, the other being in design stage, are low cost and comparatively easy to produce. They can be used not only for computation but also as robot controllers.

Nine devices feed information concerning the apparatus to be controlled into the computer, and after complicated mathematical computation, the computer controls three external pieces of equipment. The actual use to which this computer, known as JAINCOMP-C, will be put is a "military secret."

Science News Letter, December 5, 1953



MAGNETISM TEST—To determine whether canaries and other songbirds were sensitive to magnetic forces, they have been placed in cages with powerful magnets. No reaction was noticeable.

ORNITHOLOGY

Canaries Scorn Magnets Testing "Sixth" Sense

➤ CANARIES, DOVES and parakeets sing and caper, scorning powerful magnets placed in their cages to test a "sixth" sense, the Rev. John P. Delaney, S.J., professor of physics, Loyola College, Baltimore, Md., has reported.

Scientists at one time thought birds navigated during their migrations by using a magnetic sense. The homing instinct of pigeons was also believed to be connected with magnetism.

Evidence for this theory after long research is neither consistent nor conclusive, Father Delaney said. His tests with song birds were made by placing magnets in bird cages. The birds continued their play without any reaction traceable to the magnets.

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MEDICINE

Antihistamine Helps Penicillin in Heart Case

➤ A 49-YEAR-OLD woman with the heart disease, subacute bacterial endocarditis, was able to take enough penicillin to be "discharged as cured" when her doctor used the new trick of giving an antihistamine with the penicillin.

The case is reported by Dr. C. A. Beck of Michael Reese Hospital, Chicago, in the *Journal of the American Medical Association* (Nov. 28).

Science News Letter, December 5, 1953

GENERAL SCIENCE

New Publications Policy

Department of Commerce officials now outlining new policy concerning publication of results of tests on commercial products by National Bureau of Standards.

► WHAT POPULAR pamphlets resulting from tests on commercial products at the National Bureau of Standards will be available to the public is now being decided by Department of Commerce officials.

The new publications policy currently being worked out, SCIENCE SERVICE learned, will affect not only the availability of Bureau Circular 504, covering battery additives, but other Bureau circulars on sale at the Government Printing Office. It will also affect publication to the public of results of research on commercial products being run, or that will in the future be tested, at the Bureau of Standards.

Fate of the few hundred copies of National Bureau of Standards Circular 504 now left at the Government Printing Office hangs in the balance. The controversial pamphlet was snatched from GPO shelves and impounded last spring at the height of the storm aroused by the firing of Dr. Allen V. Astin as director of the Bureau. (See SNL, April 11, p. 231.)

Dr. Astin was reinstated by Secretary of Commerce Sinclair Weeks in August, and all of the special studies the Secretary ordered at the time of the firing have now been completed.

Revealed recently was a report on the Bureau's battery testing activities by a special committee of the National Academy of Sciences. It upheld previous Bureau tests, stating that the battery additive Ad-X2 was "without merit." (See SNL, Nov. 28, p. 339.)

Even though the scientists' committee has given the Bureau an "excellent" rating, however, the Standards' circular on battery additives cannot today be bought at the Government Printing Office.

When it could be bought by the public, Bureau Circular 504 was a steady selling item, averaging between 150 and 200 copies per month during the 27 months it was available. Of an original stock of 5,600, only 564 were left for sale at the time of its impoundment. GPO officials estimate that perhaps a hundred or so of these 564 may have been drawn for use of Commerce and Bureau authorities, newspapermen and scientists during the seven-month controversy.

Reconsideration of the publication policy on Bureau pamphlets results from the report of a special committee set up last April to evaluate the present functions and operations of the Bureau. Headed by Dr. Mervin J. Kelly of Bell Telephone Laboratories, the committee recommended in October that "the policy and establishment of the non-technical procedures on commercial

product tests be the responsibility of the Secretary of Commerce." (See SNL, Oct. 24, p. 262.)

When results of the Kelly committee survey were reported on Oct. 16, Secretary of Commerce Weeks stated that this recommendation included "policies as to the publication of the results of such [commercial product] tests." What the new publication policy will be has not yet crystallized.

Although testing of commercial products is an extremely small part of the work done at Standards, it is in this area that the Bureau most frequently comes to the attention of the general public.

Most recent of such cases was controversy concerning the battery additive, AD-X2. Dr. Astin's dismissal as director of the Bureau by Secretary of Commerce Weeks was on the grounds that the Bureau was not sufficiently "objective" in its battery additive tests. His later reinstatement was recommended not only by the Kelly committee but also by the Visiting Committee of the Academy, which had been asked to suggest a replacement for Dr. Astin. (See SNL, April 25, p. 263.)

Charges that the Bureau was not "objective" have now been proved wrong, but the Bureau report that was part of the controversy, Circular 504, is not yet again on sale to the public.

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GENERAL SCIENCE

WHO Ranks Third

► THE CURRENT size of the World Health Organization, which totals 84 nations since Yemen has now signed its constitution, shows that the nations of the world put health above everything except communications.

The 84-member WHO is outranked only by the 113-member International Telecommunications Union and the 93-member Universal Postal Union among the specialized agencies of the United Nations. The UN itself numbers only 60 members.

WMO, the World Meteorological Organization, now counts 79 members. Next come UNESCO and FAO, each with 68 members, ILO with 66, ICAO (International Civil Aviation Organization) with 59 members, and the International Monetary Fund and International Bank for Reconstruction and Development with 54 members each.

Two other specialized UN agencies are

• RADIO

Saturday, Dec. 12, 1953, 3:15-3:30 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS Station.

W. T. Nichols, director of the general engineering department, Monsanto Chemical Company, and C. G. Kirkbridge, president, Houdry Process Corporation, who are president and president-elect, respectively, of the American Institute of Chemical Engineers, which is holding its 46th Annual Meeting on December 13 in St. Louis, will discuss "Chemical Engineering in Modern Industry."

PSYCHOLOGY

Employers Told How to Recognize Alcoholics

► HERE IS how to recognize the alcoholic in the earlier phase of this disorder, which affects between 2,000,000 and 4,000,000 in the United States.

The Industrial Hygiene Foundation meeting in Pittsburgh, Pa., was told by Elizabeth D. Whitney of the Boston Committee on Alcoholism to watch for these signs:

1. Consistent tardiness or absence on Monday mornings, and frequent occurrences of leaving work early on Friday afternoons.

2. Recurring excuses for absence due to minor illnesses, such as colds, virus, stomach upsets.

3. Irritability in an otherwise placid worker, criticism of others, arguments, disinterest in work, slow down in production by a worker who formerly led in his department, recurring mistakes for which he defends himself, and minor accidents which he blames on others or on equipment. Pertinent examples might be found in mood swings from showy exaggeration and bragging to low periods when he avoids all personal relationships.

Science News Letter, December 5, 1953

not yet officially in existence, but each has had some nations sign its constitution. These are the International Trade Organization and the Intergovernmental Maritime Consultative Organization.

WHO's 84 members include the Soviet Union and eight other "eastern European" nations, as its officials politely term the Iron Curtain nations. These nations have been inactive since the cold war became hot, but they have not withdrawn as members.

Yemen, latest nation to join WHO, apparently did so after trying out the organization. About two years ago WHO had a request, through the UN, to send assistance to Yemen which had become alarmed about its health situation when some cases of plague occurred. Specialists were sent and evidently the assistance given the country in its fight for health brought full realization of WHO's value.

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ISLAND LORAN STATIONS—Four more Loran stations have been installed in the Far East area of the Pacific to aid navigation by airplanes and ships. Shown here, in the early stages of construction, is one of them, the new Coast Guard transmitting station on Bataan Island. The stations can transmit their signals over an area of 750 miles by day and 1,400 miles by night.

ENTOMOLOGY

Tree Damage Record

► GYPSY MOTH caterpillars ate the leaves off 1,500,000 acres of trees in New England this year, setting a new record for defoliation.

This was more than double the defoliation in the previous record outbreaks of 1945 and 1937 when about 600,000 acres of trees were damaged.

E. D. Burgess of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture reported that outbreaks of the gypsy moth, *Porthetria dispar*, seem to run in eight-year cycles. No reason has been advanced to explain why the defoliation this year is so much greater than other peak years.

Defoliation must continue for several seasons normally before trees are killed. Mr. Burgess pointed out there is evidence that partial defoliation retards the growth of trees.

Hardwood trees suffer the most during a moth attack, since normal spraying operations in orchards have eliminated the gypsy moth as a fruit pest. DDT is extremely effective in controlling and eradicating the moth, and 186,000 acres were sprayed this year to prevent the spread of the pest.

Mr. Burgess said that the moth was imported into the country in 1866 and the

federal government devotes most of its control efforts to confining the moth to the New England area.

Preliminary surveys this fall indicate that next year may also see a big outbreak. Parts of all New England states and the eastern edge of New York are troubled by the moth. Massachusetts received the heaviest damage this year.

Science News Letter, November 28, 1953

PUBLIC SAFETY

Chest-Type Safety Belt May Reduce Injuries

► A SAFETY belt that fits across your chest has been developed by Dr. John Mathewson and Derwyn Severy of the University of California at Los Angeles.

It has shown promise in preliminary tests of eliminating a major source of traffic injuries, resulting from passengers being tossed about inside an automobile when it crashes or being thrown outside.

The research has demonstrated that the new safety belt effectively restrained a very life-like dummy in test crashes against a barrier of telephone poles.

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TECHNOLOGY

Better Seafood Possible With New Fishing Boat

► FRESHER, BETTER tasting seafood may be in store for the American housewife by freezing whole fish at sea for later processing.

C. G. P. Oldershaw of the U. S. Fish and Wildlife Service Boston technical laboratory described experiments with fish freezing at sea at the second session of the first world congress on fishing boat design held in Miami, Fla.

The fishing industry has always been handicapped by the fact that the time fish spend iced on boats limits their later distribution on land. Spoilage at sea has also limited the length of time trawlers could spend away from port.

Mr. Oldershaw reported that the trawler Delaware has been altered to permit freezing at sea. The fish are sorted according to size and species after catching and then frozen in a vat of brine kept at five degrees Fahrenheit. Depending on the size of the fish, this takes from one to three hours. The frozen fish are then stored in cold rooms kept at zero Fahrenheit. After unloading in port, the fish are thawed, cleaned and prepared for distribution.

The trawler has a capacity of 130,000 pounds of frozen fish and 15,000 pounds of headed, iced fish.

The Fish and Wildlife Service is attempting to determine methods for freezing at sea and its economic feasibility. Mr. Oldershaw's report covered only the methods and equipment. The congress was sponsored by the Food and Agriculture Organization of the United Nations.

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TECHNOLOGY

Construct World's First Atomic Power Station

See Front Cover

► THE WORLD'S first atomic power station under construction is now being built in Cumberland, England. Scheduled for completion in about a year and a half, the experimental station is expected to have an output of about 50,000 watts.

A scale model of the new power station is shown on the cover of this week's SCIENCE NEWS LETTER. The large low building is the turbine house. On each side of it are the two reactors, where the heat is generated in graphite-moderated uranium piles. This heat is then transferred by gas to the four vertical boilers around each reactor.

Fans situated in the low wings on each side of the reactor circulate the gas. The steam passes to the turbine house where it drives four turbo-alternator sets. The four towers shown at the right are for cooling the turbine condensers.

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TECHNOLOGY

Plastic Balloons Solve Oil Storage Problem

► TINY PLASTIC balloons floating on top of a tank of crude oil may be the answer to one of the oilman's nightmares: evaporation.

The little balloons, which under a microscope resemble brown ping pong balls, have been created to stifle evaporation loss from large storage tanks. Filled with nitrogen gas, the phenolic resin balloons nudge each other into a tight, floating pack one inch thick.

This layer is sufficient to cut evaporation in oil storage tanks by as much as 90%, the Bakelite Company, a subsidiary of the Union Carbide and Carbon Corporation, reports. Whereas an unprotected, 55,000-barrel cone-roof storage tank loses about 1,880 barrels a year to evaporation, the pack of little plastic globules will cut the loss to about 320 barrels.

The yearly loss of oil due to evaporation is estimated to be worth \$60,000,000. About four out of each hundred barrels of crude oil in storage evaporate into the air each year.

By creating a tight pack, the balloons, which are 0.0002 to 0.0036 inches in diameter, virtually seal off the oil from the air, making it difficult for volatile components in the oil to evaporate.

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CHEMISTRY

Antibiotics Unique In Chemical Build

► THE ANTIBIOTICS, so-called mold remedies, are as wonderful in their chemistry as they are in their disease-curing powers, Prof. Donald J. Cram of the University of California at Los Angeles declared at a sectional meeting of the American Chemical Society in Alameda, Calif.

Each of them, he said, has some peculiar arrangement of atoms that has not previously appeared in natural compounds.

Organic chemists were so unwilling to believe a natural, instead of man-made, chemical could have an arrangement of atoms called a "four-membered lactam ring," he stated, that research on the structure of penicillin was frustrated for well over a year, in spite of unprecedented efforts to elucidate it.

The discovery and investigation of the antibiotics gave a healthy boost, not only to the treatment of disease, but also to the field of organic chemistry, Dr. Cram declared. The novel discoveries and the violation of preconceived ideas connected with research on the antibiotics have influenced related fields of chemistry, and have imbued scientific investigators with greater freedom of imagination in their work.

Whole new fields of research have been opened up in the study of such products as fungicides and wood preservatives, and in

such academic problems as how molecules are built and how they react toward each other.

"A tremendous stride in making cortisone more readily available was made when it was found that certain families of molds could carry out a chemical transformation in one step which, by ordinary chemical reactions, involved eight to 16 steps," said Dr. Cram. "It would appear to be only a matter of time before the capabilities of the molds and allied micro-organisms were found to include many more substitutes for ordinary organic synthetic procedures."

Science News Letter, December 5, 1953

PSYCHOLOGY

"Eisenhower" on Disk Makes It Appear Bigger

► HERE IS an interesting experiment: Place a white disk bearing the name "Eisenhower" on a wall. Then remove it and put up another disk, same size and same position, bearing a name picked at random from the telephone book.

Most persons will say that the "Eisenhower" disk was larger and placed higher on the wall than the other disk.

This is a test that was performed by Jesse Harvey at the University of California at Los Angeles for his doctoral thesis in psychology, performed under the supervision of Dr. Richard Centers.

It was an attempt to prove that visual judgment of size, elevation and color are not very reliable because they are often influenced by factors other than the physical properties of objects viewed.

Other studies performed at U.C.L.A. and elsewhere have indicated that poor children estimated the size of coins to be larger than children from well-to-do homes. Poker chips were judged to be larger if they were being used to represent money in a poker game than if they were not in use. A leaf-shaped piece of cloth was judged greener than a donkey-shaped piece of the same cloth.

Science News Letter, December 5, 1953

METEOROLOGY

Murky Skies Mean Snow—10,000 Feet Up

► WHEN THREATENING skies look like snow, even though your local Weather Bureau forecaster sticks to a prediction of rain, it may actually be snowing—10,000 to 15,000 feet above the ground.

High snow that melts as it falls, often evaporating before it reaches the ground, can cause the leaden skies that to an amateur mean "snow," I. R. Tannehill of the Weather Bureau in Washington states. It is usually about 40 degrees colder at 12,000 feet than at the surface, so even in summertime, on occasion, there can be snow high up that melts as it falls.

Science News Letter, December 5, 1953

IN SCIENCE

ENTOMOLOGY

Insects Gain Ally In War on Grain

► INSECTS IN the United States have a new ally, the Khapra beetle, in their war against the nation's grain crops.

The beetle, *Trogoderma granarium*, has been found for the first time in the Western Hemisphere in Tulare county, California. Entomologists believe that its native habitat is India.

The Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture reports that approximately 12,000 tons of wheat in two grain elevators are infested with the beetle. The wheat is of local origin and there is no record of foreign grain being stored in the elevators.

A serious storage grain pest, the Khapra beetle has been transported to most sections of Asia, Europe and Australia since World War I. The larvae of the insect feed on grain, principally wheat, barley, rice and oats.

A thorough survey is being made by department entomologists to determine the area infested with the beetles. Little is known of the beetle's habits or methods of control in this country.

Spokesmen for the Department of Agriculture indicate that the new insect is taken quite seriously. Investigators are trying to determine what eradication measures are practical.

Science News Letter, December 5, 1953

TECHNOLOGY

"Package Towboat" Sails In Water 2.5 Feet Deep

► A "PACKAGE towboat" that can be put together in water has been created in Nashville, Tenn., for the U. S. Army Transportation Corps to tug barges in extremely shallow inland waterways overseas.

The towboat's nine watertight sections can be unpacked, then floated out into the water where the boat is being bolted together. When assembled, the tug is 96 feet long, sports a beam of 24 feet, four inches, and operates in a draft of two feet, six inches.

Its three aft sections are engine rooms. They house three Caterpillar 337 engines that drive 36-inch propellers. The engines develop a total of 600 horsepower.

The unassembled towboat can be transported either by truck or rail and can be assembled in two days. It was created at the Nashville Bridge Company's plant under supervision of the Transportation Research and Development Station at Fort Eustis, Va.

Science News Letter, December 5, 1953

THE FIELDS

BOTANY

Arabs Say Adam, Eve Ate Acacia, Not Apple

► TRADITIONALLY IT was the eating of an apple that caused Adam and Eve to be expelled from the Garden of Eden, but if one Arab legend is right it was really a hard, dry acacia fruit.

Dr. Robert T. Hatt, director of the Cranbrook Institute of Science, Bloomfield Hills, Mich., traveling in Iraq found a small Arab village at the junction of the Tigris and Euphrates Rivers whose pride was a log. According to local legend, the log was from the original Tree of Knowledge.

During his visit, Dr. Hatt took some shavings from the log. After returning home, analysis of the shavings showed that the log was from an acacia tree — whose fruits are pods with hard, dry shells and unappetizing seeds. Quite unlike the juicy apple.

Science News Letter, December 5, 1953

MEDICINE

Exercise and Fitness Affect Vitamin A in Body

► EXERCISE AND physical fitness play a part in the body's handling of vitamin A and its parent chemical, carotene. Strenuous exercise seems to speed the rate at which the body converts carotene to the vitamin, but in a very fit person, this may be reversed.

Tests of 12 members of the Louisiana State University track team, made with the cooperation of A. C. Moreau, the coach, show this. The tests were made by Drs. William H. James of the university and the Agricultural Experiment Station, Baton Rouge, La., and Ibrahim M. ElGindi, now at Cairo University, Giza, Egypt.

For the tests, samples of finger blood were taken from each man about three minutes before and six minutes after a 40- to 50-minute period of strenuous activity. The activity consisted of a 15-minute warm-up, followed by running five or six 220-yard dashes at full speed at intervals of five minutes.

The level of vitamin A in the blood increased during the workout 43% on the average. The changes for each man varied from an increase of 106% in vitamin A to a decrease of 22%. The level of the parent chemical, carotene, decreased on the average 10%, with individual changes varying from an increase of 17% to a decrease of 50%.

According to the coach, the man whose vitamin A blood level increased 106% was in poor condition, while the only runner

showing a decrease in vitamin A in his blood was in excellent condition.

The studies, reported in *Science* (Nov. 20), were made following an unexpected finding in study of the effects of certain proteins in the diet on the utilization of carotene. These studies were made on albino rats. The unexpected finding consisted of puzzling irregular large fluctuations of the blood vitamin levels. The only condition that could not be controlled and might have accounted for these fluctuations was the amount of the animals' physical activity.

Since tests of this effect could be made more easily on humans than laboratory animals, the cooperation of the track team was enlisted.

Science News Letter, December 5, 1953

INVENTION

Air Force Jet Gets Landing Gear Patent

► A PATENT has been issued by the government covering an "Aircraft With Quadricycle Landing Gear." The patent applies almost certainly to the Air Force's latest, fastest, flyingest, hush-hush jet bomber now being built by the Boeing Airplane Company.

The patent points out that it is desirable to house the landing gear in the plane's fuselage rather than in the wings. Putting the landing gear in the wings means a sturdier, heavier construction that imposes design penalties.

Therefore the patent describes a landing gear arrangement, retractable into the fuselage, that supports the 300,000-pound Stratofortress with eight wheels. Four are near the nose, four near the tail.

The landing units are alike, states inventor William H. Schlender of Seattle, Wash., who assigned his patent, No. 2,659,555, to Boeing. This "duplication" thus will simplify procurement and replacement problems, he predicts.

It is hard to believe that wheels spaced so closely together can support a giant plane having a wingspan of 185 feet. But Mr. Schlender states that one object of his patent is to provide improved stability for such a landing arrangement.

He states that wing-tip wheels can be used as a safety measure in case the plane touches down with one wing low, but reports that this creates no real problem because it rarely happens.

Details on this big plane in general still are sketchy because of secrecy. It is believed, however, that the Stratofortress has a range that puts it in the "intercontinental bomber" class. The plane is powered by eight J-57 Pratt and Whitney turbojet engines, and can be refueled while in flight.

During early ground tests of the plane, onlookers at Boeing Field, Seattle, reported that it cracked seven-inch-thick concrete runways there. Its engines made so much noise that nearby buildings shook.

Science News Letter, December 5, 1953

PHYSICS

Jet's Loud Noise Sparks Photographic Study

► THE PIERCING shriek of jet engines has sparked a study at Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y., aimed at finding out how to make jet engines more "socially acceptable."

Schlieren photographs, recording on film shadows of atmospheric disturbances the eye cannot see, have revealed that noise is generated in two places when a jet of nitrogen is released. The first noisy spot is at the jet exit; the second is at the turbulence zone in the jet stream. This is the point at which the nitrogen mixes with the air.

In experiments in which compressed nitrogen was ejected from small copper tubing at supersonic and subsonic speeds, it was shown that the turbulence of the jet stream was less at subsonic speeds than at supersonic speeds. The noise generated in that zone also was less intense.

Writing in the *Journal of Applied Physics* (Aug.), Daniel S. Schwartz and Anthony L. Russo, both of the research laboratory, stated their investigations would be extended to jets of larger diameters.

Science News Letter, December 5, 1953

SURGERY

Refrigeration May Take Place of Artificial Heart

► A SUGGESTION that refrigeration of patients before heart operations may take the place of complicated and costly heart-lung machines appears in a report of four Denver medical men to the *Journal of the American Medical Association* (Nov. 21).

They have used the refrigeration method in 15 patients. Of these, one died as a result of the operation. A second patient died later but the operation showed that he could not have been saved by any method. The others have had excellent results.

The refrigeration, which is really cooling, is done by putting the patient in a tub full of ice water until the body temperature has dropped from the normal 98.6 degrees Fahrenheit to between 70.7 and 78.8 degrees Fahrenheit.

After the operation, the patient is warmed to normal by immersion in a tub of warm water.

Object of the refrigeration is to slow circulation so that the heart can be emptied of blood and kept empty to let the surgeon see clearly while he operates. An anesthetic is also given. Heart-lung machines do the same by circulating the blood through the machine outside the patient's body. The Denver doctors think, however, that the cooling method is simpler, less expensive, and worth further trial.

Drs. Henry Swan, Irvin Zeavin, S. Gilbert Blount Jr. and Robert W. Virtue of the University of Colorado School of Medicine report the 15 operations.

Science News Letter, December 5, 1953

PSYCHOLOGY

The Human Price of Combat

Research team of scientists, for the first time, took instruments to front lines to learn just what the strain of battle does to a man's body and mind.

By MARJORIE VAN DE WATER

► NOW FOR the first time scientists know what happens to a man's body and mind under the terrific strain of combat.

Taking their test tubes, needles, gauges and mental tests right up to the front line in Korea, they have learned something of what made one man come through with flying colors and distinction while another broke into uncontrolled sobbing or a speechless, quivering wreck of a man.

Now that the fighting has stopped, it can be told.

Worst place for a man to be during combat is alone in a place of relative security. Sitting there, inactive, while buddies are shot down can shatter a man's morale and sanity.

Carrying a wounded friend back to where he can get help only to find that he has died without ever reaching succor seems to be the worst experience that can befall a soldier.

It is strain like this and not the enemy's bullets, knives or bayonets that try men's souls the most.

The assessment of the human cost of combat was made by a research team made up of scientists from various fields. Included in the party of 13 were five civilians from the Operations Research Office of Johns Hopkins University, which sponsored the study under contract with the Army, five people from the Office of Naval Research, two scientists from the office of the Surgeon General of the Army and one from the Naval Medical Research Institute.

Taking part were scientists from the fields of physiology, biochemistry, psychiatry, psychology, medicine and nutrition.

WAVES in Combat Zone

It marked the first time that Navy WAVES were taken into the combat zone. Two women officers were taken along because of special technical qualifications. These women who made history for their sex were Lt. (j.g.) Elaine L. Walker, and Lt. (j.g.) Muriel E. Johnston, both physiologists. Lt. Walker had the experience of being within 25 yards of an enemy mortar round when it burst.

With their laboratory mounted on two jeeps and a trailer, the research team of 13 covered the central front and some of the heaviest action for a period of seven weeks.

The strain of combat is strictly an individual matter, it was found. Two men fighting side by side, climbing the same

mountain pathways, subjected to the same enemy fire, straining every sense to detect the close presence of the enemy, carrying the same weight of burdensome pack, eating the same diet, fortified by the same training and special knowledge and weapons, nevertheless are each in a private world of stress and strain. That is because it is what the situation means to the individual soldier that is important, not the external facts.

One man may fear death; it takes every ounce of his courage to go forward toward the enemy. Every shell burst is a hideous climax of torture to this man. Another may be comparatively indifferent to death, safe in the confidence of divine protection or reassured by a strong faith in life after death. This man is not worried about a shell "unless it has his name on it." One man may be intelligent and well-trained and confident in his own ability; another

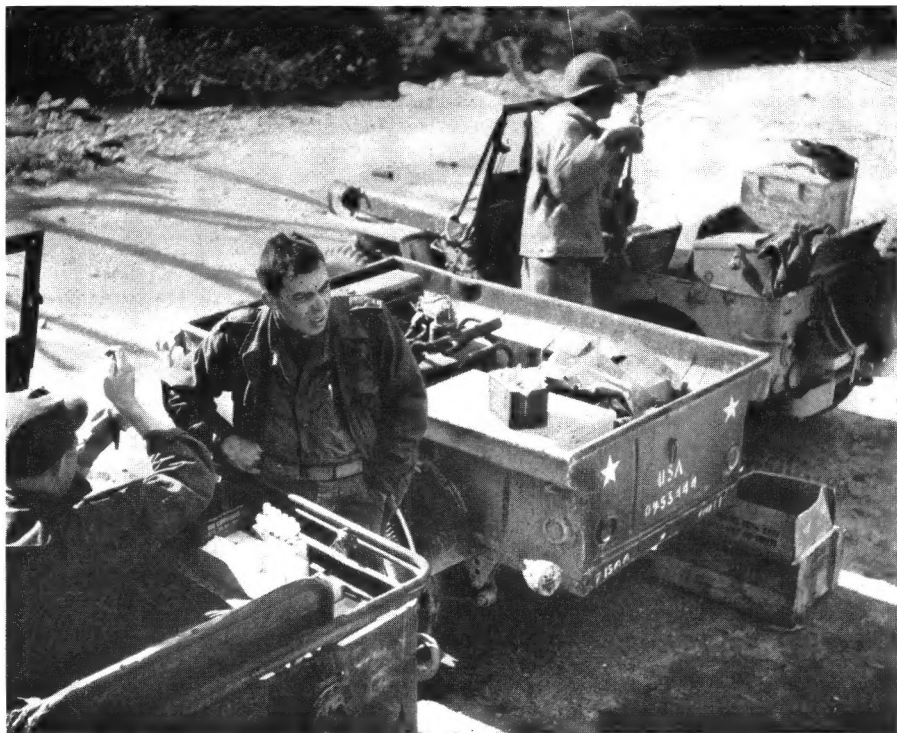
may be new to the situation and distrustful of himself.

But no matter how difficult the situation faced by any individual soldier, he is able to stand up to it while "the heat is on." In no case observed by the research team did a soldier crack up mentally during actual combat. It is when the urgent demands of duty let up; when he has made the long trip back to comparative safety, particularly if he is carrying or aiding a seriously wounded friend and especially if the friend dies on the way; or when he must wait alone in a position of comparative safety or wait, defenseless, under enemy artillery fire that a soldier may break.

The strain of combat does not paralyze the functioning of the higher brain centers, it was found. If anything, a man thinks better when "the heat is on."

White Cell Shortage

Striking finding from the blood studies of men just come out of combat was a great shortage of white blood cells. The shortage is apparently due to a disappearance from the blood stream of adult white blood



TESTING COMBAT EFFECTS—In these two jeeps and trailer, a research team of 13 scientists took their centrifuges, hypodermic needles and other laboratory equipment right up to the front lines in Korea to find out what the toll of battle is on a man's body and mind. Here Lieut. Fred Schaffer, USNR, centrifuges fresh samples of blood and racks them up as Lieut. John Kilbuck, USNR, another member of the team, watches the troops.

cells. Instead of 18 adult cells to one immature cell, the proportion was changed to three immature cells to only one adult. It is the adult white blood cell that battles for the life of an individual when an infectious agent enters the blood stream, so an absence of these cells could expose the soldier to danger from infection.

A similar shortage of adult white blood cells occurs in the blood of persons who have been very severely burned or who have suffered from such acute infections as a ruptured appendix.

Weight Lost by Dehydration

However, in the case of the combat soldier, no one knows what has happened to the adult white blood cells. Does the stress of combat in some way act as a poison in the blood of the soldier so that the cells are destroyed in repelling this toxic invader?

Another striking finding was that the man in combat loses water from his body. This is only natural. The man in combat is scared. That means that he sweats profusely. He urinates frequently.

Yet in spite of losing water in these ways, the man in combat does not drink. It may be because he is just too busy to think about it, but the chances are he has no particular desire for water under the circumstances.

As a result of the dehydration, the man in combat loses weight. He does not usually realize this; in fact, he may tell you that he gains at the front. It is true that he gains, but this occurs after he comes back from the attack or patrol, after his recovery from the stress of severe combat, when the body is again storing the natural supply of water.

The man in combat or on a patrol does not eat. He does not find fault with the food provided for him; it is the man back a little way who complains bitterly when the food is not hot or when the diet is not varied enough. The man in contact with the enemy just has no interest in eating. Rather than walking a few hundred feet to where a hot meal is being served, he will stay in his bunker and nibble on "C" rations.

Men who make a shock attack on an enemy stronghold carry assault rations with them, but only a few eat any part of their supply even though the attack may last 16 hours.

They say they are "too busy," "not hungry" or that their stomachs are "weak." Some complain of nausea.

Pill Against Crackup?

Failure to eat and maintain his nutritional well-being probably adds to the stress endured by the combat soldier. A man should be well fed if he is to maintain his peak resistance to the stress of combat.

Getting his men to eat and drink would seem to be a new responsibility of the unit leader in battle.

Will it some day be possible to give a

man a pill or an injection that will immunize him against a physical or mental crackup in combat? This is a question I put to one of the scientists of the research team, Dr. Stanley Davis of the Operations Research Office.

It will be possible, he assured me. However, the research team are not yet ready to recommend such a measure. It may be, he said, that taking a dose of some hormone would enable the soldier to stand up under strains that otherwise would cause him to break. But when such a fortified soldier did reach his breaking point, it might not be possible for him to recover. It may be nature's way of protecting the human organism to set a limit beyond which a man cannot drive himself. It will be necessary to know a great deal more than scientists know now about the human's ability to stand strain and to recover from it, before they are willing to recommend an "anti-strain" shot in the arm for men going into combat.

Recovery Time Lengthy

It takes much longer anyway to recover from combat strains than has been supposed. A couple of days back of the front line and "a good night's sleep" are not enough. It is more like 5 to 12 days before the soldier is back to normal.

It is now known that it calls for a delicate balance in the functioning of the body's defense mechanism to withstand stress. Links in the chain are the hypothalamus, "emotion center" of the brain, the pituitary, a small gland at the base of the brain, and the adrenal glands.

When a man is badly frightened or greatly angered, the hypothalamus is roused. It acts on the pituitary, causing it to secrete ACTH. This, in turn, acts on the adrenal gland, stimulating it to secrete the recently discovered compound F along with other hormones.

After a brief but very difficult encounter with the enemy, the pituitary apparently lets down on the job. When the soldier is given a shot of ACTH, supplementing the activity of the pituitary, the adrenals respond by increased activity. But after a prolonged period of severe combat, the soldier loses the ability to prod his adrenals into service. Then the ACTH injection no longer has effect.

Science News Letter, December 5, 1953

HORTICULTURE

Use of Weed Killers Delays Tree Replantings

► KILLING SCRUB growth with chemical herbicides, such as 2,4,5-T and 2,4-D, will prevent successful replanting with other tree seedlings for probably six months or more.

U. S. Forest Service tests at Upper Darby, Pa., show that most trees planted five to seven days after the chemical spraying do not grow.

Science News Letter, December 5, 1953

BIOCHEMISTRY

Soothing Drug Now on Market

► A NEW drug that calms nervous patients as well as reducing blood pressure is now on the market, its manufacturers, Ciba Pharmaceutical Products, Inc., announced in Summit, N. J.

The drug is called Serpasil. It is an alkaloid from the herb, *Rauwolfia serpentina*, long used in India.

Its sedative action comes from its depressing effect on the hypothalamus, a structure located in the midbrain which is believed to be the seat of basic uncontrolled emotional behavior. Other sedative medicines, such as the barbiturates, act by depressing the cerebral cortex, or thinking part, of the brain.

Science News Letter, December 5, 1953

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE ACANTHACEAE OF COLOMBIA, II—Emery C. Leonard—*Gov't Printing Office*, Contributions from the United States National Herbarium Vol. 31, Part 2, 203 p., illus., paper, 70 cents. Nine genera, including 106 species, of which 73 are described as new, are discussed.

AFIELD WITH PLANT LOVERS AND COLLECTORS: Botanical Correspondence of the Late Harry N. Patterson with the Great Botanical Collectors and Distributors of America from 1870 to 1919—Alice L. Kibbe, Ed.—*Kibbe and Gem City Business College*, 565 p., illus., \$7.00. The correspondence of a botanist-plant explorer with his colleagues covering the period from 1870 to 1919. Biographical sketches of H. N. Patterson and S. B. Mead are included.

CAUSES OF INDUSTRIAL PEACE UNDER COLLECTIVE BARGAINING: ATLANTIC STEEL COMPANY AND UNITED STEELWORKERS OF AMERICA, A Case Study—Glenn W. Gilman and James W. Sweetney—*National Planning Association*, 101 p., paper, \$1.00.

GEOGRAPHY IN THE TWENTIETH CENTURY: A Study of Growth, Fields, Techniques, Aims, and Trends—Griffith Taylor, Ed.—*Philosophical Library*, 2nd ed., 661 p., illus., \$8.75. Intended to appeal primarily to mature students of geography, and advancing some ideas of the author for which he does not expect acceptance until 1976.

HOW TO TROUBLESHOOT A TV RECEIVER—J. Richard Johnson—*Rider*, 124 p., illus., paper, \$1.80. Finding the trouble in a modern television receiver takes more time than remedying it. This book for the television technician may provide some short cuts.

INDUSTRIAL HYGIENE FOUNDATION—*Mellon Institute*, 8 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Describing a non-profit research association for the advancement of occupational health.

INTERNATIONAL REVIEW OF CYTOLOGY: Volume II—G. H. Bourne and J. F. Danielli, Eds.—*Academic*, 545 p., illus., \$11.00. Cytology and cell physiology are regarded by the editors as a single field, and the reviews are drawn from some of the most active areas in this field.

LAND AND WATER TRAILS—Ellsworth Jaeger—*Macmillan*, 227 p., illus., \$2.95. Here the author attempts by drawings and by words to "blaze a trail" to outdoor knowledge.

MOTHER AND BABY CARE IN PICTURES—Louise Zabriskie—*Lippincott*, 4th ed., 244 p., illus., \$3.00. Answering the prospective mother's questions about preparation for the coming of the baby as well as care after birth. By the director of a maternity consultation service.

PLANNING GUIDE FOR RADIOLOGIC INSTALLATIONS—Wendell G. Scott, Chairman, Committee on Planning of Radiologic Installations, American College of Radiology—*Year Book Publishers*, 336 p., illus., \$8.00. Prepared as a joint undertaking in response to requests for an authentic source of information on the subject. Forty-nine prominent specialists contributed.

PRACTICAL POULTRY BREEDING—Don C. Warren—*Macmillan*, 242 p., illus., \$4.50. Much of the data accumulated on genetics in poultry has been of little use to the practical poultry breeder; the economic traits which interest him are of complicated inheritance. This book represents the author's interpretation of the practical applications of the knowledge of genetics.

RAND McNALLY WORLD GUIDE—*Rand McNally*, 726 p., illus., \$6.95. A compact reference book on geography arranged by countries and continents.

SCIENTIFIC AMERICAN READER—George Gamow and others—*Simon & Schuster*, 626 p., illus., \$6.00. Written by scientists to explain their work, and edited by the science writers who revived the old "Scientific American" magazine.

SCIENTIFIC RESEARCH AND DEVELOPMENT IN AMERICAN INDUSTRY: A Study of Manpower and Costs—Bureau of Labor Statistics in co-operation with U. S. Dept. of Defense—*Govt. Printing Office*, Dept. of Labor Bulletin No. 1148, 106 p., illus., paper, 50 cents. The final report on a survey of research in private industry and non-profit agencies other than educational institutions. About 96,000 research engineers and scientists were employed by the nearly 2,000 companies in the study.

SEMIMICRO QUALITATIVE ANALYSIS—Hervey Hubbard Barber and T. Ivan Taylor—*Harper*, revised ed., 404 p., illus., \$4.50. Theoretical material is integrated with laboratory work in this textbook for students who already have had training in general chemistry.

SOIL SCIENCE SIMPLIFIED—Helmut Kohnke—*Kohnke*, 66 p., illus., paper, \$1.00. A concise book for busy people, providing them with useful information in readable form.

TECHNICAL ASPECTS OF SOUND: Volume I, Sonic Range and Airborne Sound—E. G. Richardson, Ed.—*Elsevier*, 544 p., illus., \$11.00. Intended to fill a need for a "handbook" to cover all the technical aspects of the subject of sound. For research workers, industrialists and advanced students.

TECHNICAL ILLUSTRATION—*Higgins Ink Company*, 62 p., illus., paper, \$2.50. Three-dimensional drawing, the introduction comments, is becoming more important because of the demand of industrialists, in spite of the fact that engineering schools do not teach it.

Science News Letter, December 5, 1953

AGRICULTURE

Hormones Increase Rubber Production

► RUBBER YIELDS as high as 75% above normal have been obtained in experiments with hormone treatment of the rubber-tree bark, the Rubber Research Institute of Malaya reports.

Small concentrations of hormones and sodium salts in palm oil applied to the bark just below the tapping point gave the best results in these tests. On the other hand, injections of copper sulfate in holes bored into the rubber trees, a procedure long known by rubber planters to increase rubber yields, proved objectionable for several reasons, the Malaysians found.

The hormone treatment was given for 14 months in the area where the rubber yield increased 75%. In another area production shot up 20% to 30% above normal over a period of one and a half years' treatment.

In contrast, the copper-sulfate treatment turned out to be harmful to the wood and bark of the tree, uneconomic and likely to run the copper content of the latex concentrates up. The rubber experts stressed this last disadvantage, since accidental spilling of copper sulfate in administering the injections would highly contaminate the latex.

Science News Letter, December 5, 1953

Special Combination

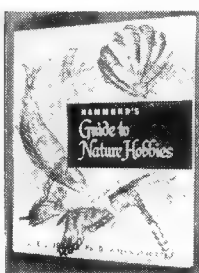
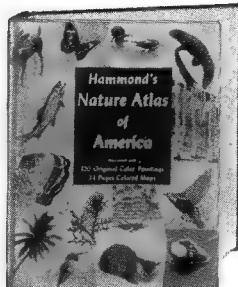
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WILDLIFE

21 Whooping Cranes Now in Texas Refuge

➤ TWENTY-ONE WHOOPING cranes, rarest and tallest of American birds, have landed in their winter home at the Aransas National Wildlife Refuge, Texas. Officials have hopes that at least three stragglers, late leaving Canada, will swell the number.

The U. S. Fish and Wildlife Service is maintaining a daily check on the refuge. Last spring the same number of birds set out for Saskatchewan.

Each spring and fall, conservation groups in the United States and Canada join forces to protect the stately cranes, near extinction, from ignorant hunters. Their migration carries them over the Dakotas, Nebraska, Kansas, Oklahoma and much of Texas to their refuge in the marshes near Aransas.

Of the birds now in the refuge, 18 are adults and three are young birds. This loss of old adults and addition of a small number of young birds is normal, officials report.

Hopes for more birds were raised by observations of three cranes in Canada in November. It takes about three weeks for the cranes to make the long flight.

The number of cranes in recent years has stayed around 20, with 23 reported in 1952. American pioneers on the plains saw many of the magnificent birds, but civilization has almost brought them to extinction.

Science News Letter, December 5, 1953

AGRICULTURE

Farm Implements Do Not Mix Soil Conditioners

➤ ORDINARY FARM implements, such as disk harrows and moldboard plows, will not mix soil conditioners uniformly into the soil, W. C. Hulbert and R. G. Menzel of the U. S. Department of Agriculture have found.

Soil conditioners act only on the soil they actually contact. Ordinary tillage is a rolling and crumbling of soil within itself without changing the relative position of soil particles or mixing the soil.

Moldboard plows and disk harrows, the implements that are the basis of present tillage systems, are not effective in mixing the soil. In tests, plows tended to concentrate trace elements in strings or sloping sheets, and harrows, while effective in mixing vertically, did not mix horizontally.

The most effective implements found for mixing the soil were rotary tillers and spring-tooth implements. These heavy and costly machines mixed the soil to a depth of about six inches, but there is little prospect they will become common on farms.

One group of tests used radioactive phosphorus as the traceable element, and a second test used sorghum grain to represent soil conditioners. The land was tilled prior to the tests.

Science News Letter, December 5, 1953

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Foe Into Friend

► UNTIL QUITE recently, man has regarded the forest as his enemy. He who made a clearing was a benefactor to the community as well as an operator for his own gain; the new field increased the potential food supply, and added the resources of one family to the communal defense against a hostile world of savage beasts, and even more savage men, that lurked behind the leafy frontier.

This culture pattern of making a virtue of getting rid of trees in order to get at the land, is of recent memory in this country; but it only repeated what happened a few centuries ago in Europe.

How completely this attitude toward the forest has now been reversed! The forest now is our friend—and suddenly discovered to be an old and rather ailing friend, needing sympathetic assistance of every kind to aid in recovery and restoration of helpful strength. The good we derive from the forest is being studied from every angle, the harm we do to it, wittingly and unwittingly, is being investigated as painstakingly, and possible cures or preventive for its many ills are being found, each by a scientific specialist.

About the only prescription there was for the forest a century ago was the rough surgery of ax and saw and the harsh cauterity of reckless fire. But now we see planting dibbles and spades, pruning knives and shears, insecticides and fungicides, all solicitously applied in the infancy and youth of the forest, so that in its maturity the ax and saw—more judiciously wielded now—may have a measured harvest.

We see, too, the manifold kindnesses that man may win from this ancient friend, once looked upon as a foe. Our grandsires saw only logs for cabins, later boards and squared timbers for more pretentious houses, plus, possibly, some potash for the soapmaking and a few casual nuts and wild fruits.

We still get these, though not in such abundance, but we have added the endless acres of newsprint we read every day, chemicals ranging from synthetic lacquer to synthetic liquor, protection for our cities' water supplies, pleasant places for camping, hunting and fishing, and other items quite literally too numerous to mention.

No wonder we feel as if we had almost murdered Santa Claus!

Science News Letter, December 5, 1953

MEDICINE

Leukemia Protection

► THE START of leukemia in mice can be delayed by a period corresponding to nearly 20 years in the life of a human by treatment with cortisone, Dr. George W. Woolley and Betty A. Peters have found in experiments at the Jackson Laboratory, Bar Harbor, Me.

Dr. Woolley also carries on cancer research at Sloan-Kettering Institute of Memorial Cancer Center, New York.

Dr. Woolley and Miss Peters worked with a strain of mice that develop leukemia with almost clocklike regularity at about eight months of age. The leukemia is rapidly fatal, killing the animals in one or two weeks.

By treating these mice with cortisone, anti-arthritis hormone of the adrenal cortex, from the time they are one month old, Dr. Woolley has delayed the onset of leukemia

until the mice are about 14 months old. That would be tantamount in humans to postponing a fatal disease from 23 years of age until about 40.

Dr. Woolley's observations have indicated that the adrenal glands play an important role in leukemia, the American Cancer Society states. The findings cannot be applied to prevention of the disease in humans, however, because there is no way of telling in advance who will develop leukemia. And cortisone, these and other experiments have shown, makes animals and humans extremely susceptible to a variety of infections. Most of the mice, treated monthly with a dose of cortisone, eventually died of infections.

Science News Letter, December 5, 1953

Questions

GENERAL SCIENCE—How many member nations are in the largest UN agency? p. 358.

□ □ □

PHYSICS—How can an electronic "brain" be forced to play music? p. 357.

□ □ □

PSYCHOLOGY—What are the main effects of combat on the soldier? p. 362.

□ □ □

SURGERY—How can refrigeration take the place of an artificial heart? p. 361.

□ □ □

TECHNOLOGY—What is the yearly oil loss due to evaporation estimated to be? p. 360.

□ □ □

Photographs: Cover, British Information Services; p. 355, Fremont Davis; p. 357, Rev. John P. Delaney; p. 359, U. S. Coast Guard; p. 368, Crest Specialty Company.

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Thorium

Without previous experience in the manufacture of m-cresoxyacetic acid, we accepted an order for several kilos of the compound the other day. This is not exceptional. The generalized nature of our synthetic operations often permits us to make chemicals in larger-than-laboratory quantities more efficiently than our customers can do it for themselves. Accustomed as we are in these cases to keep our nose out of other people's business, we didn't ask any questions. Nevertheless, we did note that a team from a university in South India had broken into print not long ago with the tidings that m-cresoxyacetic acid makes an excellent reagent for separating thorium from the rare earths of the local monazite sands and from uranium. Impressed, we called the compound *m-Toloxycetic Acid* in accordance with *Chemical Abstracts* nomenclature and added it as Eastman 6883 to our list of more than 3500 Eastman Organic Chemicals.

By writing to Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y., you can obtain any or all of the following: 1) a frank appraisal of our readiness to supply larger-than-laboratory quantities of any organic compound you require; 2) a catalog of the organics we stock; 3) an abstract of the procedure for thorium; 4) 10 grams of m-Toloxycetic Acid for \$3.50 to carry it out with; 5) an explanation of the system by which we renamed it as we did.

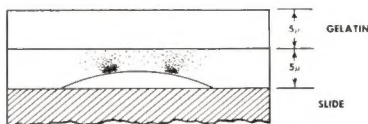


Autoradiography

One who makes good microscope preparations is something of an artist, although he may also be a first-rate scientist. If autoradiography is involved in the preparation, it widens the scope for artistry in matching medium to subject. For autoradiographer no less than for fashion photographer, we provide a choice of sensitized medium and technique:

Kodak Autoradiographic Permeable Base Stripping Film (Experimental) has a 5-micron-thick emulsion (thinnest emulsion to be found in any Kodak sensitized product, by

the way) coated atop a 5-micron layer of plain gelatin which provides mechanical support after the two together are stripped off the ordinary film base that acts as a carrier. Emulsion side down, the combination is then floated onto the microscope slide. Processing solutions permeate the photographically inert gelatin, but since it takes on no density, it cannot contribute to the overlapping of densities from active sites. *K.A.P.B.S.F. (E.)* is supplied 35mm wide and unperforated, 5 feet to a roll.



Not to be confused with it is *Kodak Autoradiographic Stripping Film, Type NTB*. This consists of a 10-micron emulsion on a thin cellulose ester film which can be split off from a carrier sheet of ordinary film base. The impermeable cellulose ester layer tends to eliminate chemical and abrasion artifacts and prevents direct contact between the photographic developer and the radioactive section. It also prevents stain in the tissue section from staining the emulsion. The material comes as 4" x 5" sheets.

For work where low radiation flux necessitates sacrifice of fine-grain qualities for higher sensitivity, we can supply 25-micron-coated *Kodak Autoradiographic Plates, Type A*. An even greater sacrifice in that direction is represented by *Kodak Autoradiographic Plates, Type No-Screen*.

If you know which autoradiographic material you want, just call up your Kodak Industrial Dealer and order it. If you have questions, write Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y., and find out if we can answer them.

Intense development

Call us peculiar if you will. Here for better than half a dozen years we have had a means of doubling effective emulsion speed by merely adding something to the developer and yet we've made precious little noise

about it. This is not diffidence but reluctance to set off a trend that might in the long run prove inimical to beautiful photography. The gain in sensitivity is not without cost in loss of definition, high base fog, and emphasis on fingerprints, abrasion marks, etc.

But perhaps our attitude has been too stuffy. One of the major newspaper organizations, though rarely faced with photographing a black cat in a coalbin at midnight, has been accepting help from "Solution A" on difficult night shots. Since the results are good enough for them, they're probably good enough for others who find that the most sensitive films still need to be squeezed a little occasionally.

We have no desire to enshroud "Solution A" in mystery. Its ingredients are hydrazine dihydrochloride, which promotes development of some silver halide grains that have not actually absorbed light photons,



and 6-nitrobenzimidazole nitrate, an anti-foggant. When 30 cc of it is thoroughly mixed into one liter of the familiar *Kodak Developer D-19*, you have *Kodak Developer SD-19a*. Develop conventional high speed negative materials in this at 75 F for 8 to 12 minutes with intermittent agitation. Best speed increase is generally found at a development time that gives a base fog around 0.40.

Any Kodak dealer can order for you *Kodak Solution A* for *Kodak Developer SD-19a*. (He'd better write it down just that way!) A quart costs \$2.65. It is specifically designed for use with *Kodak Developer D-19* and no other.

All prices quoted are subject to change without notice.

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⚙️ **SANDBAG FOR cars** is easily carried in the trunk and holds enough sand to provide grit when traction is needed on slippery, snow-covered roads. Made of a mildew-proof fabric, the bag has a tapered design which permits the user to control the flow of sand easily.

Science News Letter, December 5, 1953

⚙️ **TELEPHONE INDEX** for the businessman or housewife holds names, addresses and telephone numbers in a small plastic compartment that attaches to the bottom of the telephone. The numbers are written on pull-out cards with alphabetized tabs protruding from the front of the compartment. Space is available on the cards for a brief advertisement.

Science News Letter, December 5, 1953

⚙️ **CARBON DRAWING INK** has been developed that can be used on glass and other water-repellent surfaces without damage due to freezing and thawing. The ink itself can be rendered water resistant by a brief cure at 180 degrees Fahrenheit.

Science News Letter, December 5, 1953

⚙️ **PLANT FEEDER**, pushed into the soil in flower pots, slowly permits water or plant



food to trickle through a sponge at its bottom to water or nourish the plant's roots. The device, shown in the photograph, is sufficiently long that it can be used to "stake up" taller plants.

Science News Letter, December 5, 1953

⚙️ **NEW WEATHERSTRIPPING** consists of a plastic rib to which is attached wool pile—thousands of tiny brush-like fibers. The fibers fill the irregularities around doors and windows that admit harsh winter winds to houses. Somewhat similar to the felt liners around car windows, the weatherstripping is easily tacked into place and is said to be long-wearing.

Science News Letter, December 5, 1953

⚙️ **INDUSTRIAL X-RAY** film is ultra-fine-grained and is particularly useful where minute detail is desired. With million-volt X-ray or betatron equipment, it may be used in the examination of steel up to three inches in thickness. At low voltages it can be used to picture low-opacity materials such as aluminum, corn and wheat.

Science News Letter, December 5, 1953

⚙️ **EARPHONES, RESEMBLING** a doctor's stethoscope, have a small phone jack that plugs into the electronic amplifying systems in churches, theaters, schools and hospitals. Also suitable for secretarial and aviation uses, each headset has its own volume control and weighs only 1.2 ounces.

Science News Letter, December 5, 1953

⚙️ **INTERLINING FOR** winter garments consists of a fluffy, soft, lightweight layer of glass fibers covered with a fabric facing. Said to be the warmest for its weight ever developed for the clothing industry, the interliner is dry cleanable, washable and moth-proof. It will be used in some women's and men's coats and children's outerwear for the coming season.

Science News Letter, December 5, 1953

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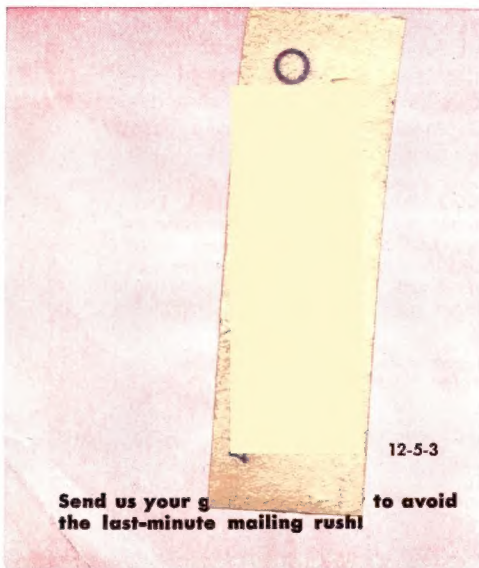
A device has been developed to weigh bits of protein of extremely small mass by measurement of the amount of X-ray absorbed by the pieces tested.

Crickets' chirps have surprising carrying power; one cricket barely an inch long can be heard nearly a mile.

The mileage death rate for the United States, the number of deaths per 100,000,000 miles, is at its lowest point in history.

Last year 17 children below the age of four years died of lead poisoning in New York City alone.

The United States is the world's third largest exporter of rice, ranking after Thailand and Burma.



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